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10/621,035	07/15/2003	William Paul Mazotti	NSC1P271/P05589	1188

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EXAMINER	
SONG, SARAH U	

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 11/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/621,035	MAZOTTI ET AL.	
	Examiner	Art Unit	
	Sarah Song	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 April, 21 July and 24 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21 and 25-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21 and 25-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's communication filed on April 21, 2005 has been carefully studied by the Examiner. The arguments advanced therein, considered together with the amendments made to the claims, are persuasive and the rejections based upon prior art made of record in the previous Office Action are withdrawn. Claims 1-5, 7, 8, 12 and 25 have been amended. Claims 22-24 have been canceled. Claims 28-31 are newly added. Claims 1-21 and 25-31 are pending.

Claim Objections

2. Claim 1 is objected to because of the following informalities: "the base substrate" in line 10 and "the photonic device" in line 14 lack proper antecedent basis. Appropriate correction is required. Note also claim 4 for recitation of "the base substrate" and claims 5 and 28 for recitation of "the photonic device".

3. Claim 5 is objected to because of the following informalities: lines 1 and 2 appear to be incomplete (i.e. "wherein the photonic device suitable for receiving or sending signals; and..."). Appropriate correction is required.

4. Claim 8 is objected to because of the following informalities: "the base support" in line 2 lacks proper antecedent basis. Appropriate correction is required.

5. Claim 25 is objected to because of the following informalities: "the photonic device" in line 13 lacks proper antecedent basis. Appropriate correction is required. Note also claim 4 for recitation of "the base substrate".

6. Claims 7 and 30 are objected to because of the following informalities: in lines 4 and 2 respectively, Examiner suggests changing "singled" to –single—. Appropriate correction is required.

7. Claim 31 is objected to because of the following informalities: in line 1, Examiner suggests inserting –comprises— after "block". Appropriate correction is required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. **Claims 1, 8, 13-21, 29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giboney et al. (U.S. Patent 6,318,909 newly cited) in view of (Rosenberg et al. (U.S. Patent 6,703,561 newly cited).**

10. Regarding claims 1, 12, 13 and 15-18, Giboney et al. discloses an opto-electronic module having an optical port and an electrical port comprising:

- a first rigid substrate having electrical traces (i.e. circuit of PCB, column 20, lines 2-6), a port end, and an interior end;
- an opto-electronic device 10 attached to an electrically connected to the first substrate wherein the opto-electronic device serves as the optical port wherein the opto-electronic device comprises:
    - o a semiconductor chip package 92 and other electronic devices mounted to the first substrate;
    - o a support block 29 having a first face and a second face that are angled relative to one another with electrical traces that extend from the first face to the second face wherein the first face of the base substrate is mounted on the chip package so that

chip electrical contacts are electrically coupled to associated traces on the support block (column 7, lines 21-50); and

- an optical device package 32 mounted on the second face of the support block, the photonic device having at least one active facet thereon and having electrical contacts that art electrically coupled to associated traces on the support block.

11. Giboney et al. does not expressly disclose a second substrate and a flex connector as claimed.

12. Rosenberg et al. discloses an opto-electronic module having an optical port, an electrical port, a first substrate, an opto-electronic device, and

- a second rigid substrate having electrical traces (i.e. PCB), the second substrate having a port end and an interior end, wherein the port end forms the electrical port; and
- a flex connector 820 that is a flexible band containing a plurality of electrically conductive wires, wherein the flex connector connects the electrical traces within the first and the second substrates, whereby the flex connector allows for adjustable positioning of the height of the optical port with respect to the height of the electrical port. See Figure 4E.

13. Giboney et al. and Rosenberg et al. are analogous art as pertaining to opto-electronic modules.

14. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the module of Giboney et al. to further comprise the second substrate and flex connector as claimed.

15. One of ordinary skill in the art would have been motivated to make the modification in order to impart structural flexibility in the structure of opto-electronic for ease of manufacture or assembly.

16. Regarding claim 8, the first and second faces are perpendicular to one another.

17. Regarding claim 14, Rosenberg et al. does not expressly disclose the contacts of the second substrate. However, PCBs typically have a top surface and a bottom surface, wherein the electrical port includes electrical contacts on the top surface, bottom surface or top and bottom surfaces. Therefore, the modification would have been obvious to one of ordinary skill in the art to provide ease of connections.

18. Regarding claim 19 Giboney et al. in view of Rosenberg et al. does not expressly disclose that the module is suitable for sending, receiving, or sending and receiving data signals at a rate of approximately 2.5 Giga bytes per second or greater. However, such modules are well known in the art. Therefore, it would have been obvious to one having ordinary skill in the art to provide a module operating at 2.5 Giga bytes per second in order to provide improved communication capabilities with the structural flexibility afforded by the flex connector of Giboney et al. in view of Rosenberg et al.

19. Regarding claim 20, Giboney et al. discloses a case having an optical interface opening and an electrical interface opening. See Figure 6A.

20. Regarding claim 21, Giboney et al. in view of Rosenberg et al. does not expressly disclose that the flex connector is integrally formed with the first and second substrates. However, integrated flex connectors are well known in the art. It would have been obvious to

one having ordinary skill in the art at the time the invention was made to provide an integral flex connector to provide ease of assembly.

21. Regarding claim 29, Giboney et al. in view of Rosenberg et al. disclosed all of the claimed limitations as discussed above with regards to claim 1, except for the protective case enclosing the two substantially parallel circuit boards. Protective cases for opto-electronic modules comprising two substantially parallel circuit boards are well known in the art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a protective case for the purpose of isolating the module from undesirable environmental factors.

22. Regarding claim 31, the support block 29 includes electrical traces formed on a flexi tape 25 that is mounted on the support block and extends from the first face to the second face of the block so that the photonic device is electrically connected to the electrical traces of the flexi tape and the exposed electrical contacts of the semiconductor package. See column 7, lines 21-50.

23. **Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giboney et al. in view of Rosenberg et al. as applied to claim 1 above, and further in view of Hargis et al. (U.S. Patent 6,792,171 previously relied upon).**

24. Regarding claim 2, Giboney et al. in view of Rosenberg et al. does not expressly disclose that the flex connector is suitable for transmitting differential signals between the first and second substrate.

25. Hargis et al. discloses a flex connector 18 that is suitable for transmitting differential signals between a first and second substrate. See column 3, lines 47-55.

26. Giboney et al. in view of Rosenberg et al. and Hargis et al. are analogous art as pertaining to opto-electronic modules comprising flex connectors.

27. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the flex connector 820 of Giboney et al. in view of Rosenberg et al. such that it is suitable for transmitting differential signals as taught by Hargis et al.

28. One of ordinary skill in the art would have bee motivated to provide the flex connector that is suitable for transmitting differential signals in order to ensure signal quality.

29. Regarding claim 3, the electrically conductive wires of the flex connector is connected to the interior end of the second substrate and the interior end of the first substrate. See Figure 4E of Rosenberg et al.

30. **Claims 4-6 and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giboney et al. in view of Rosenberg et al. as applied to claim 1 above, and further in view of Nguyen et al. (U.S. Patent 6,707,140 previously relied upon).**

31. Regarding claims 4 and 10, Giboney et al. in view of Rosenberg et al. does not expressly disclose the semiconductor chip that includes a semiconductor die that is at least partially encapsulated within a protective molding material; electrical contacts formed on a top surface of the semiconductor die such that the contacts are exposed through a surface of the protective molding material; and wherein the optical device package is mounted to the surface of the protective molding material such that the optical device package is electrically connected to the chip package using the electrical traces of the base substrate and the exposed electrical contacts.

32. Nguyen et al. discloses a semiconductor device package that includes a semiconductor die that is at least partially encapsulated within a protective molding material; electrical contacts

formed on a top surface of the semiconductor die such that the contacts are exposed through a surface of the protective molding material; an optical device package that is mounted to the surface of the protective molding material such that the optical device package is electrically connected to the exposed electrical contacts. See Abstract.

33. Giboney et al. in view of Rosenberg et al. and Nguyen et al. are analogous art as pertaining to opto-electronic modules.

34. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the semiconductor device package including a semiconductor die encapsulated within a protective molding material, electrical contacts formed on a top surface of the die such that the contacts are exposed through the surface of the protective molding material, and the optical device package mounted to the surface of the protective molding material such that the optical device package is electrically connected to the exposed electrical contacts in order to provide a robust configuration.

35. Regarding claims 5 and 11, Giboney et al. in view of Rosenberg et al. discloses the optical device package comprising at least one photonic device 32 suitable for receiving or sending optical signals; wherein the support block 29 includes electrical traces formed on a flexi tape 25 that is mounted on the support block and extends from the first face to the second face of the block so that the photonic device is electrically connected to the electrical traces of the flexi tape and the exposed electrical contacts of the semiconductor package. See column 7, lines 21-50.

36. Regarding claim 6, the photonic device 32 comprises more than one photonic device. Although not expressly disclosed, it is commonly known in the art to configured at least one to

receive optical signals and at least one to send optical signals for the purpose of an optical transceiver system.

37. Regarding claim 8, it is noted that the opto-electronic device is attached along the port end of the first substrate and the photonic device is mounted on a face of the support block that faces the port end of the first substrate.

38. Regarding claim 9, Rosenberg et al. discloses the module further comprises a barrel unit that is attached to the optical device package, the barrel unit having at least one hollow tube that provides optical access to the optical device package. The barrel unit would have been obvious to provide a hermetic enclosure for optimal operation of the device package. See Figure 4E and 4F.

39. **Claims 7, 28 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giboney et al. in view of Rosenberg and Nguyen et al. as applied to claim 5 above, and further in view of Hargis et al.**

40. Regarding claims 7 and 28, Giboney et al. in view of Rosenberg et al. and Nguyen et al. does not expressly disclose an electrical converter on the second face for transmitting differential signals.

41. Hargis et al. discloses an electrical converter 12 transmitting differential signals between a first and second substrate. See column 3, lines 35-55.

42. Giboney et al., Rosenberg et al., Nguyen et al. and Hargis et al. are analogous art as pertaining to opto-electronic modules.

43. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the electrical converter for transmitting differential signals as taught by Hargis et al.

44. One of ordinary skill in the art would have bee motivated to provide the electrical converter for transmitting differential signals in order to ensure signal quality.

45. Furthermore, it would have been obvious to locate the electrical converter in close proximity to the photonic device to provide a compact structure.

46. **Claims 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (U.S. Patent 6,821,027 previously relied upon) in view of Giboney et al.**

47. Regarding claims 25 and 27, Lee et al. discloses an opto-electronic module having an optical port and an electrical port comprising:

- a first substrate 146 having electrical traces 202, a port end, and an interior end;
- an opto-electronic device 124 attached to and electrically connected to the first substrate wherein the opto-electronic device serves as the optical port;
- a second substrate 166 having electrical traces (i.e. PCB), the second substrate having a port end and an interior end, wherein the port end forms the electrical port; and
- an intermediate substrate 148 containing a plurality of electrically conductive traces, wherein the intermediate substrate connects the electrical traces within the first and the second substrates, wherein a thickness of the intermediate substrate separates the height of the optical port with respect to the height of the electrical port by a desired distance.

48. Regarding claim 27, the intermediate substrate is sandwiched between the second substrate and the first substrate.

49. Lee et al. does not expressly disclose the claimed opto-electronic device.

50. Giboney et al. discloses an opto-electronic device comprising:

- a semiconductor chip package 92 and other electronic devices mounted to the first substrate;
- a support block 29 having a first face and a second face that are angled relative to one another with electrical traces that extend from the first face to the second face wherein the first face of the base substrate is mounted on the chip package so that chip electrical contacts are electrically coupled to associated traces on the support block (column 7, lines 21-50); and
- an optical device package 32 mounted on the second face of the support block, the photonic device having at least one active facet thereon and having electrical contacts that art electrically coupled to associated traces on the support block.

51. Lee et al. and Giboney et al. are analogous art as pertaining to opto-electronic modules.

52. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the opto-electronic device of Giboney in the device of Lee et al. for the purpose of providing direct communication between the device and the fiber, thereby improving loss characteristics of the device.

53. **Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. in view of Giboney et al. as applied to claim 25 above, and further in view of Hargis et al.**

54. Regarding claim 26, Lee et al. in view of Giboney et al. does not expressly disclose that the intermediate substrate is suitable for transmitting differential signals between the first and second substrate.

55. Hargis et al. discloses a flex connector 18 that is suitable for transmitting differential signals between a first and second substrate. See column 3, lines 47-55.

56. Lee et al, Giboney et al. and Hargis et al. are analogous art as pertaining to opto-electronic modules comprising flex connectors.

57. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the electrical connector of Lee et al. such that it is suitable for transmitting differential signals as taught by Hargis et al.

58. One of ordinary skill in the art would have bee motivated to provide the flex connector that is suitable for transmitting differential signals in order to ensure signal quality.

Response to Arguments

59. Applicant's arguments with respect to claims 1-21 and 25-31 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

60. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah Song whose telephone number is 571-272-2359. The examiner can normally be reached on M-Th 7:30am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 571-272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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